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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/950,091	09/10/2001	Joe G. Rich SR.	43062-0001	2103

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EXAMINER

SCALTRITO, DONALD V

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 06/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/950,091

Applicant(s)

RICH, JOE G.

Examiner

Donald V Scaltrito

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 September 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-14, 19-21 and 34-39 is/are rejected.
- 7) ☒ Claim(s) 7-9, 15-18, 22-33 and 40-46 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 6, 10-14, 19, 34 & 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sprouse (U.S. Patent No. 5,306,577) in view of Feigenbaum et al. (EP 0181134).

Sprouse discloses a variable pressure passive regenerative fuel cell system wherein both the fuel cell and electrolyzer are designed to operate under variable pressure conditions. Sprouse discloses a fuel cell system comprising a first and second storage tank for hydrogen and an oxidant, a fuel cell stack that sits above a water tank and an electrolysis unit that sits below the water tank (see Figure 1 of this reference; see also column 2, line 56 – column 3, line 41). Sprouse fails to teach or fairly suggest, however, an electrolyte recovery unit disposed within the fuel cell system.

Feigenbaum et al. teach an electrolyte recovery system for use in a fuel cell having a means for removing and collecting the electrolyte from the reactants after it has exited the fuel cell. Feigenbaum et al. go on to teach that it is beneficial to remove, collect, and purify the electrolyte because it leads to a better overall efficiency of fuel cell system operation while at the same time minimizes the probability of fuel cell system failure (see pages 4-6 of this reference).

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With respect to Claim 1, it would have been obvious to one of ordinary skill in the art at the time the invention as a whole was made to incorporate an electrolyte recovery unit, as taught by Feigenbaum et al., into the invention of Sprouse because Feigenbaum et al. teach that it is beneficial to recover and purify an electrolyte because it leads to a better overall efficiency of fuel cell system operation while at the same time minimizes the probability of fuel cell system failure. With respect to Claim 2, Sprouse discloses a hydrogen tank that is connected and hence, engaged, to the fuel cell stack (Figure 1). With respect to Claim 6, Sprouse discloses an oxidant tank that is connected and hence, engaged, to the fuel cell stack (Figure 1). With respect to Claim 10, Sprouse discloses an electrolyzer that supplies hydrogen, oxygen and electrons to the fuel cell, rendering them integrally connected (column 3, lines 21-40). With respect to Claims 11-13, Sprouse discloses a fuel cell comprising at least two electrodes wherein one electrode is an anode and the other is a cathode. With respect to Claim 14, Sprouse discloses a proton exchange membrane (column 3, lines 42-46). With respect to Claim 19, Sprouse discloses that hydrogen and oxygen are reacted in the fuel cell stack to produce electricity and water. With respect to Claim 34, Sprouse discloses that the number of cells, either fuel or electrolytic, depends on how much electrical output is desired (column 3, lines 47-53).

With respect to Claim 35, Sprouse discloses all of these method steps except for directing an electrolyte flow to an electrolyte recovery pump and redirecting the flow elsewhere. Feigenbaum et al. disclose the limitation of sending an electrolyte to a recovery pump and redirecting it elsewhere.

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Claims 3-6 & 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sprouse and Feigenbaum et al., as applied to Claim 1 above, and further in view of Boehm et al. (U.S. Patent No. 6,461,751).

Both Sprouse and Feigenbaum et al. fail to teach or fairly suggest the use of valves to regulate pressure and control the flow of fuel and oxidant gases from their respective storage containers.

Boehm et al. disclose a method of improving the overall efficiency of a fuel cell system by reducing parasitic power consumption. A controller is programmed to decrease oxidant stoichiometry until oxidant starvation is detected or until oxidant stoichiometry is about one. When oxidant starvation is detected, the oxidant stoichiometry is increased until oxidant starvation is no longer detected (note abstract). Boehm et al. teach that it is beneficial to use regulate and control the pressure and flow rate from a fuel storage container via the use of valves because this method allows for greater control over fuel and oxidant stoichiometry and indirectly can decrease the amount of parasitic power drainage within the fuel cell system (see column 3 line 34 – column 4, line 25 of this reference).

With respect to Claims 3, 4, 6 & 36-39, it would have been obvious at the time the invention as a whole was made to incorporate the valves for controlling pressure and flow rate of fuel and oxidant gases from their respective containers, as taught by Boehm et al., because Boehm et al. teach that it is beneficial to use regulate and control the pressure and flow rate from a fuel storage container via the use of valves because this method allows for greater control over fuel and oxidant stoichiometry and indirectly can decrease the amount of parasitic power

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drainage within the fuel cell system. With respect to Claim 5, Boehm et al. teach that other fuels, such as hydrocarbons, methanol or natural gas can be employed (column 10, lines 5-8).

Claims 20 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sprouse and Feigenbaum et al., as applied to Claim 1 above, and further in view of Lohrberg et al. (U.S. Patent No. 4,839,013).

Both Sprouse and Feigenbaum et al. fail to teach or fairly suggest the use of a plate electrode structure within an electrolyzer unit. Lohrberg et al. teach an electrode assembly for gas-forming electrolyzers comprising vertical plate electrodes, opposite electrodes and a membrane between the two (note abstract). Lohrberg et al. teach that the distribution of current in the membrane is improved and the voltage drop is decreased electrode geometries as those of plate electrodes are employed (see column 4, lines 12-39 of this reference).

With respect to Claim 20, it would have been obvious to one of ordinary skill in the art at the time the invention as a whole was made to incorporate plate electrodes, as taught by Lohrberg et al. because Lohrberg et al. teach that plate electrode geometries lead to an improved distribution of current in the membrane and a decrease in the voltage drop across the electrochemical cell. With respect to Claim 21, Lohrberg et al. teach that the electrolytic unit contains an electrolyte (column 4, lines 62-64).

***Allowable Subject Matter***

Claims 7-9, 15-18, 22-33 & 40-46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the

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limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach or fairly suggest a second pressure valve or a second flow control valve disposed on an oxidant storage tank. The prior art of record fails to teach or fairly suggest the use of a glass separator or a glass liquid separator. The prior art of record fails to teach or fairly suggest the use of a heat exchanger to control the temperature of a fuel cell. The prior art of record fails to teach or fairly suggest the redirection of electrolyte flow to either an electrolysis unit or to a third storage tank.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald Scaltrito, whose telephone number is 703.305.4926. The examiner can be reached in his office on Monday-Friday between the hours of 9am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, may be reached at 703.308.4333. The official fax number for the organization where this application or proceeding is assigned is 703.305.3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661

Donald Scaltrito  
Patent Examiner  
Art Unit 1746  
June 19, 2003

  
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